

Status and Future of Mountain Research

Results of two Surveys by the Research Initiative of the Mountain Partnership

A Discussion Paper



2006

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With the support of:
the Leading Members of the Research Initiative of the Mountain Partnership, and
the Mountain Partnership Secretariat

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This paper was prepared by the Centre for Development and Environment (CDE) with the support of the lead members of the Research Initiative of the Mountain Partnership and the Mountain Partnership Secretariat. Funds for carrying out the surveys were provided by Swiss Agency for Development and Cooperation (SDC).

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Summary and conclusions

This report contains the results of two e-surveys conducted in 2005 and 2006 on the status and future of mountain research, as it presents itself within the Mountain Partnership. The surveys are the main outcome of a meeting of the leading members of the Mountain Partnership's Research Initiative in 2004.

Survey 1 addresses the **status of mountain research**, specifically the following questions:

- Who is doing what in mountain research?
- Who is doing research where?
- What is the nature of involvement in research?

Survey 2 addresses the **future of mountain research**. It deals with:

- core problems that should be addressed by research in future
- opportunities and potentials in mountain areas to be addressed by research
- institutional circumstances conducive for research work

The surveys were carried out in 2005-06 by the Centre for Development and Environment (CDE) at the University of Bern, based on the mandate given to CDE by the lead members of the Research Initiative on the occasion of the meeting in Cusco. They were developed and conducted in close collaboration with these lead members and with the Mountain Partnership Secretariat at FAO. Funds for carrying out the surveys were provided by SDC (Swiss Agency for Development and Cooperation). The full content of this report is available on the Mountain Partnership website (www.mountainpartnership.org/initiatives, scroll for research initiative).

Survey 1: Status of mountain research

23 out of 57 members of the Research Initiative responded to this survey, including 10 of the 13 lead members. The survey gave the following results:

- *In geographical terms*, the responding institutions are active in *most major mountain regions of the world*, and some institutions – larger ones – are *also active at a global level*. A regional concentration of activities can be noted for the European Alps, the Hindukush-Himalaya and Karakorum massif, the Andes, and the mountain regions of Central Asia. Interestingly, North Africa and the Middle East are not mentioned as regions of activity. This regional gap includes a number of countries with extensive mountain areas, all forming part of the Islamic world (Table 1 in this report).
- Relating to the *research approach*, research work as understood by the members of the Research Initiative includes important transfer functions such as capacity development, policy advice, and sensitisation. It thus reaches out beyond classical academic research, where transfer is generally limited to university education. Transdisciplinary and interdisciplinary approaches are therefore more often used than the classical disciplinary approach (Table 2).
- *Thematically*, research covers a wide range of topics – over 50 themes in 7 broad research realms which include socio-culture, policy and institutions, biophysical environment, land use, energy, economics, and infrastructure/services. In terms of past and current research priorities, biophysical and environmental themes come first, followed by research in policy and institutions. Themes relating to economy, infrastructure, and energy issues are clearly less prominent. (Table 3).
- With regard to the *classical production–conservation dilemma*, conservation aspects dominate the research agenda, as compared to aspects of production and local welfare (economy, infrastructure, services), and a major issue making ever bigger headlines at global level follows at the bottom of the research priorities: the energy question (Tables 4-10).
- *Research with a local focus* (livelihoods) takes precedence over regional, or spatially up-scaled, research. For example, the highland-lowland linkage system is not a prominent research priority. However, pointing out the importance of such linkages could help enhance the position of mountains and of mountain research on regional, national and international agendas (Tables 4-10).

Survey 2: What future for mountain research?

40 out of the 120 members of the Mountain Partnership responded to this survey. The following paragraphs present a summary of the results:

- *Core problems of mountain areas to be addressed by future research in mountains:* Respondents were asked to rank core problems from a given list of 30 themes. Their ranking covered a wide range of the themes suggested in the list, ranging from biophysical topics to livelihoods, socio-culture, economy, and policy/politics. Weak political position and negotiation power of mountain areas, inequality of access to resources, poverty and insecurity of livelihoods, poor services, fragile ecosystems, and resource degradation, received the highest score as very high or high future research priorities (Table 12).
- *Opportunities and potentials of mountain areas to be addressed by research in future:* To complement the above list of core problems, respondents were asked to indicate opportunities and potentials of mountain areas that should be researched in future. No pre-set list of options was given. The response shows a strong emphasis on economic questions, with an exclusive focus on tourism and marketing of (local) niche products. Sustainable land management including payment for ecological services, and culture and identity are also seen as important potentials of mountain areas to be addressed by research (Table 13).
- *How to create an environment conducive for research:* Cooperation and coordination between research institutions, linkage with local communities, and adequate communication are seen as the most important ingredients for successful social embedment of research. Adequate knowledge on the socio-cultural environment in which research takes place was also specifically mentioned, as was the appropriateness of the research approach. Linkage with international institutions, NGOs, and political/administrative institutions is seen as less important. At the bottom follows linkage with private sector enterprises (Table 14).

Conclusions

- Following the results of the two surveys, research as perceived by the responding institutions has an important role to play in understanding mountain environments and ecosystems, and in providing baseline information for sustainable use of mountain resources. Research activities go beyond classical research, and include policy advice and sensitisation. In the eyes of the responding institutions, research can contribute to mountain development by:
 - assessing the potential of mountain biodiversity and mountain resources in general, especially with regard to niche products for regional and international markets and the development of sustainable forms of tourism;
 - helping find ways for integrating local people as actors and stakeholders in development, and for supporting local knowledge in technology development for sustainable land use and product development;
 - helping promote long term mechanisms for benefit sharing between lowlands and mountains, including payment for ecosystem services.
- The respondents hold that research and research partnerships can also contribute substantially to the promotion of good governance and the enhancement of the weak political negotiation power of mountains. Respondents of the survey mention the following possibilities:
 - enhance processes of institutional development and capacity building at all levels of society;
 - identify adequate institutional frameworks and multi-stakeholder processes focusing on specific development issues;
 - up-scale contextualised experience while strengthening local capacity and power;
 - create and capitalise on alliances within and among mountain areas;
 - provide tools for informed decision-making and sensitisation.

Background

This report contains the results of two e-surveys conducted in 2005 and 2006 on the status and future of mountain research, as it presents itself within the Mountain Partnership. The surveys are the main outcome of a meeting of the leading members of the Mountain Partnership's Research Initiative, which took place prior to the Second Global Meeting of the Mountain Partnership in Cusco in October 2004. In that meeting, two issues relating to research in mountains were discussed:

1) *status of mountain research*: it was concluded that while much is known about mountain regions, this knowledge is fragmented among sources, institutions, and themes. Better understanding and wider dissemination of information about research programmes, researchers' interests and capacities is thus needed. It could lead to new and more effective collaborations and increase the contribution of research to sustainable mountain development.

2) *future of mountain research*: it was concluded that getting a more complete picture of research is not sufficient. Certain key issues of mountain development might demand more research attention and resources in future.

It was then decided that these two points should be addressed by way of e-surveys among members of the Mountain Partnership.

Survey 1: Status of mountain research

The survey was addressed to *members of the Research Initiative only*. It provides an overview of existing mountain research programmes, researchers, and institutions and addressed the following questions:

- Who is doing what in mountain research?
- Who is doing research where?
- What is the nature of involvement in research?

Survey 2: What future for mountain research?

As the future of mountain research was felt to be a question of broader interest, the second survey was sent *to all members of the Mountain Partnership*, with the aim of collecting information on **personal perceptions** relating to:

- core problems that should be addressed by research in future
- opportunities and potentials in mountain areas to be addressed by research
- institutional circumstances conducive for research work

The surveys were carried out in 2005-06 by the Centre for Development and Environment (CDE) at the University of Bern, based on the mandate given to CDE by the lead members of the Research Initiative on the occasion of the meeting in Cusco. They were developed and conducted in close collaboration with these lead members and with the Mountain Partnership Secretariat at FAO. Funds for carrying out the surveys was provided by SDC (Swiss Agency for Development and Cooperation).

The results of both surveys and hence the full content of this report are available on the Mountain Partnership website (www.mountainpartnership.org/initiatives, scroll for research initiative).

The Mountain Partnership and its Research Initiative

The Mountain Partnership is a voluntary alliance of partners dedicated to improving the lives of mountain people and protecting mountain environments around the world. Launched at the World Summit for Sustainable Development in 2002, the Mountain Partnership taps the wealth and diversity of resources, information, knowledge, and expertise of its members to support positive change in mountain areas. The dynamic core of the Mountain Partnership lies in its thematic and regional initiatives. The Research Initiative is one of these initiatives. In late 2006, it comprised 57 members (23 countries, 9 intergovernmental organizations, and 25 major groups and NGOs). The goal of this Initiative is to enhance the contribution of scientific research to sustainable development of mountain regions. For more information, please visit: www.mountainpartnership.org

Survey 1: Status of mountain research

The questionnaire was sent to all members of the Research Initiative by the Secretariat of the Mountain Partnership at FAO in December 2005¹. It aimed at seeking the institutional perspective, not personal opinions. The themes covered by the survey are:

- 1) **Regional involvement of members of the Research Initiative**
- 2) **Kind and type of involvement of members**
- 3) **Thematic focus of members' research work**

The total number of institutions responding to the survey was 23 (out of the 57 who are members of the Research Initiative). This includes the response of 8 of the 13 lead members of the Initiative. Figure 1 presents the location of the responding institutions on a global map. While respondents are spread globally, important mountain areas are not represented, such as those in North America, Eastern Africa, North Africa and Near East. Europe is better represented in this survey than other regions.

The results of the survey are presented in the following paragraphs. A list of the responding institutions can be found in [Appendix 1](#) of this report, and a full copy of the questionnaire in [Appendix 2](#).

Figure 1: Location of institutions responding to the survey



¹ When speaking of “members” of the Research Initiative, reference is made to institutions and not to individual experts or members of staff, since it is the institution which is as a whole a member of the Research Initiative.

1.1. Regional involvement of members of the Research Initiative

The members of the Research Initiative were asked to indicate their geographical regions of involvement relating to mountain research (Appendix 2, Question 2).

The results show that the responding institutions are active in *all major mountain regions of the world*, and some institutions – larger ones – are *also active at a global level* relating to mountain research and development. Based on the analysis of the questionnaires, a regional concentration of activities can be noted for the European Alps, the Hindukush-Himalaya and Karakorum massif, the Andes, and the mountain regions of Central Asia. Interestingly, North Africa and the Middle East are not mentioned as regions of activity.

Table 1: Regional involvement

Region	No of responding institutions engaged:	Details
Global involvement	9	
Europe	8	Alps; Bohemian Massif, Carpathians; Balkans and South-East European mountains, Scottish Highlands. Europe in general
Russian Federation and CIS (including Central Asia)	5	Central Asian mountains (Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan, Uzbekistan); Altai; Caucasus
Asia-Pacific	7	Hindu Kush-Himalaya, Karakorum; Tien Shan, Greater Mekong Subregion (Lao PDR, Thailand); Mountains in China, India, and South Asia
Africa	5	Mountains in the Horn of Africa, in Eastern and Southern Africa (Ethiopia, Kenya, Tanzania; Malawi and Mozambique; Swaziland, Southern Africa; and in West Africa (Ghana, Nigeria, Liberia, Sierra Leone)
America (incl. North and South America, Caribbean)	4	Andes and tropical Andes (Bolivia, Peru); Rocky Mountains, Sierra Nevada; Central America (Jamaica)
Other regions	1	Antarctica

Source: Questionnaire Survey 1. 20 institutions answered this question. Note that multiple responses were possible.

1.2. Kind and type of involvement of members

Under this topic, the members of the Research Initiative were asked to indicate the kind of their involvement relating to mountain research. They could select one or several types of involvement from a list. Some of these involvements focus on research work proper, others on related aspects such as knowledge management, outreach, capacity building, and sensitisation. (Appendix 2, Question 3)

The analysis shows that alongside research, most of the responding members *include important transfer elements*; their involvement goes thus far beyond of what is normally seen as a classical, or academic, research portfolio. The reason for this could be that very few of the responding institutions are part of academia; only two are linked to, or part of, universities. Table 2 below presents the results.

Inasmuch as *classical research work* is concerned, almost all of the responding 20 institutions are actively involved in this field (with two exceptions); this concerns either field work, or coordination, or both of these activities. Transfer activities are as important as research work. These activities include *capacity development, but also policy development /advice and sensitisation*; the latter two, which are not normally associated with research, get even higher marks than classical research activities, such as knowledge management, publication, documentation, and data banking. Involvement in transfer activities of members, however, clearly excludes extension work, defined as the implementation of recommendations of research; most probably because this needs a different set of know-how, competence, and partners, and often much more funding.

Most of the responding institutions are not funding institutions, and thus *depend on external funds* to carry out their activities. This is typical for the Research Initiative and also highly representative for the Mountain Partnership as a whole. As Table 2 shows, only 6 of the responding institutions provide funding for research. Two of them limit themselves to research funding and have no other research activities (UIAA, The III Millennio Foundation).

Table 2: Type of involvement

Type of involvement	No of responses
Research field work	13
Research coordination	16
Research funding	6
SUBTOTAL Research	35
Outreach (implementation of recommendations of research)	8
Extension	2
Policy development, policy advice	14
Capacity development, education, training	17
Awareness creation, sensitisation	10
Communication, event management	8
SUBTOTAL Outreach	59
Publication, documentation, library services	12
Data banking	6
SUBTOTAL Knowledge Management	18

Source: questionnaire survey 1. 20 institutions answered this question. Note that multiple responses were possible.

1.3. Thematic focus of members' research work

Under this topic, which makes up for the major part of the questionnaire, the responding institutions were asked to insert in which thematic fields they are active, and to indicate priority and research approach in a thematic-priority matrix, which featured seven broad thematic realms, i.e. socio-culture, policy and institutions, biophysical, land use, energy, economics, and infrastructure / services. These seven realms contained a total of 54 research themes (Appendix 2, Question 1).

1.3.1. Synthesis

Mountain research, as represented by the 23 institutions partaking in the survey, addresses a **very wide range of themes**. Overall, the list of topics addressed by these institutions covers over 50 themes (Appendix 2, Question 1). These cover seven broad realms, which include *the human sphere* (socio-culture, policy and institutions, economy, infrastructure and services) as well as the *biophysical sphere* (environment, ecology), and also themes relating to *land use* where the above spheres overlap. Also at the level of **individual institutions**, research **activity profiles are broad** and do generally not focus on a single theme or research realm. There is considerable overlap between individual institutions in their activities; such overlaps are fields of potential exchange and partnership.

Natural resource management, with a strong orientation towards biodiversity and issues related to protected areas, dominate the research agenda. Livelihood research also features prominently. As the priority indices for the various research realms and the scores for the research themes show, themes relating to *ecology and environment* get the highest score as high and medium research priorities, followed by themes pertaining to *socio-culture, policy, and land use*. Themes related to *economy, energy, infrastructure and services*, follow in third place, with the exception of *tourism* which features more prominently. Table 3 below presents a ranking overview of the 21 themes (out of the total list of 54 themes, see Appendix 2) that were most often mentioned as a high or medium research priorities.

Overall, the research activity profile revealed by this survey clearly **reflects mainstream global agenda setting**, which positions mountains as biodiversity hotspots, areas for recreation, and also as areas particularly sensitive to global climate change. It remains open as to **how well this global agenda reflects the priorities expressed at the local level**, i.e. by mountain communities. There is a wealth of local and regional evidence which shows that mountain communities give more weight to economic and service aspects, and in general rank production over conservation.

It would thus be interesting to confront mountain communities with the research agenda as it resulted from the present survey. The conclusion is not far-fetched that there is a certain gap between the view of research institutions and that of local mountain populations as regards priorities and needs for research. This is not to suggest that the responding research institutions should change, or adapt, their research priorities, but rather to think about ways and means of how to complement the research agenda within the Research Initiative on the whole accordingly. A possible way forward could be to motivate institutions active in the fields that are found lacking to join the Research Initiative.

Table 3: Top priority research realms and research themes

Research realms	Research priority		Priority Index*
	High	medium	
<i>Social, socio-economic and socio-culture</i>			4.5
Livelihoods	11	6	
Local culture, local knowledge	9	4	
Poverty, marginalisation	8	5	
<i>Policy, politics and institutions</i>			6
Empowerment, participation	9	5	
Alliance building, partnerships	9	2	
Policy frameworks, legal frameworks	9	5	
<i>Biophysical environment and ecology</i>			
Biodiversity	18	1	6.6
Ecosystems (functions, services, processes)	14	4	
Forests, protection forests	12	3	
Climate, climate change	10	3	
<i>Land use</i>			5.1
Natural resource management	14	5	
Protected areas, parks	14	4	
Highland-lowland linkages	9	4	
<i>Energy</i>			2.5
Renewable energies	7	3	
Hydropower	1	6	
<i>Economy, economics</i>			3.2
Tourism	11	3	
Income generation, economic diversification	6	6	
Environmental economics (e.g. compensation mechanisms)	6	5	
<i>Infrastructure and services</i>			2.9
Education	6	4	
Water and sanitation	5	6	
Health	6	0	

Source: questionnaire survey 1. 23 institutions answered this question.

* priority index: total number of *high priority* score within research realm, divided by total number of themes per realm (research realm = printed in bold italics).

Interestingly, **highland-lowland linkages** are less often mentioned as a research priority that one might have expected. This is probably so because these linkages are included in other themes, and probably also because of their complexity both relating to space and range of issues. However, given the great importance mountains and mountain resources have for the surrounding lowlands, and considering the effects of an increasingly globalised and interconnected world, highland-lowland linkages might become more important as a research priority in future. It would also be an opportunity to make mountain research more relevant for decision makers and the general public in lowland centres, as the results concern more people, in larger areas.

Research approach

Under this topic, the responding institutions were asked to insert which research approaches they use for their various thematic areas of work. For each of these areas of work, they could indicate, which of the following approaches they employ: disciplinary, interdisciplinary, and transdisciplinary (Appendix 2, Question 1). Multiple responses were possible. The total scores for each approach are shown in the following paragraph.

The survey revealed that mountain research is based on disciplinary, interdisciplinary and transdisciplinary approaches. The approach depends on the research theme and on the nature of the transfer activities mentioned earlier. Interdisciplinary work is most often mentioned, (338 scores), followed by transdisciplinary (226 scores) and disciplinary approaches (105 scores). Classical disciplinary research is thus well represented, but collaboration between disciplines and between research and stakeholders outside research is more important. This is again indicative of the fact that the **institutions** represented by this survey, and probably by the Mountain Partnership Research Initiative as a whole, transcend classical academic (disciplinary) research and have made important steps to involve society at large in their work.

The approach chosen by the responding institutions varies with the research realm; while disciplinary approaches are prominent mostly in ecology and environmental research, interdisciplinary and transdisciplinary work dominates socio-culture, policy and land use research. For details, see the following chapters on the different research realms.

1.3.2. Results by research realms (detailed results)

The seven research realms with a total of 54 themes that were listed in the questionnaire can be found in Appendix 2 of this report. This chapter here presents the results of the survey by each of the realms.

Realm 1: Socio-economic and cultural themes

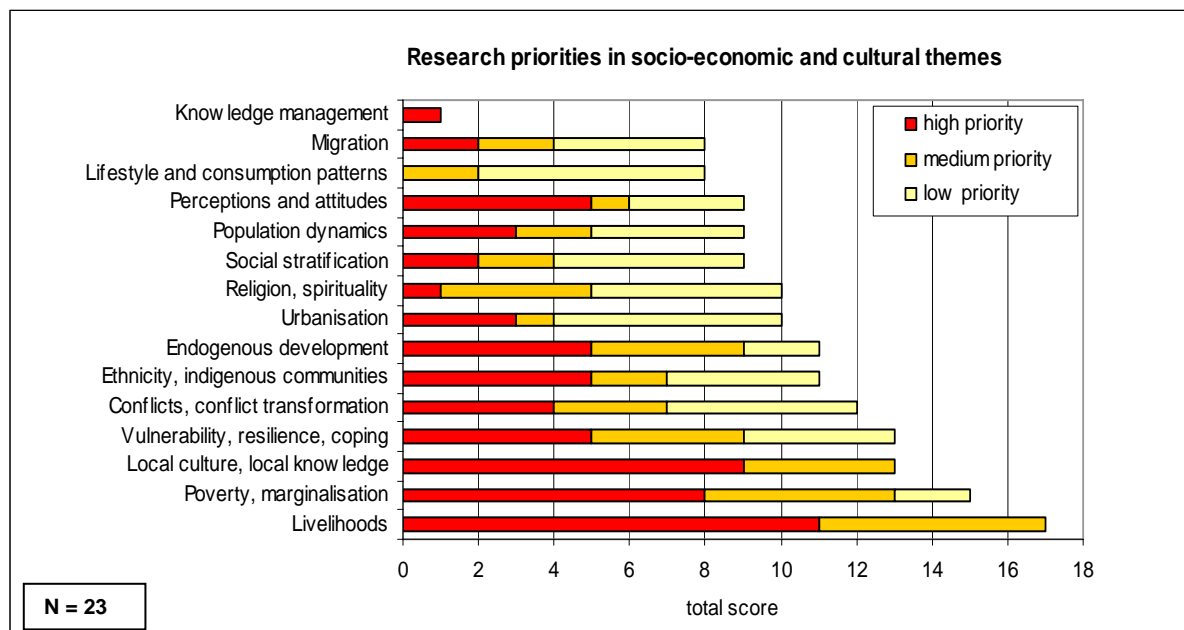
The survey shows that a wide range of themes is covered by the responding institutions in this research realm (Table 4). The theme most often mentioned as a research priority is **livelihoods**, which in itself covers many aspects, and which is relevant for almost all institutions that have participated in the survey. This indicates a concentration of research at the **household and local community level, rather than to regional or national levels**. This is also shown by the high score of the theme *ethnicity and indigenous communities*. Other themes deal with specific livelihood aspects, such as *vulnerability and resilience*, and *poverty and marginalisation*, themes which link key mountain issues with the global development agenda (MDGs). **Conflict transformation** is another prominent theme, which is not surprising considering the fact that in the last 50 years conflicts in mountain regions have greatly increased and are now almost twice as likely to occur in mountains than in other regions.

A second cluster of prominent research themes deals with *local culture, local knowledge, and endogenous development*. This could indicate that research institutions tend to put more emphasis on local potentials and assets, as against external ones, when it comes to strengthen development and livelihoods.

Population dynamics, migration, urbanisation are less prominent research fields than might have been expected, given the fact that urbanisation is increasing in mountain areas, and that seasonal or permanent migration has a long history and has become part of the local culture in many mountain areas.

Spirituality and religion as research themes are often mentioned, however mainly as low research priorities. *Social stratification* and *lifestyle/consumption patterns* per se are not in-themes in mountain research at present moment.

Table 4



Approaches in this realm:

The research approaches in these themes are mainly interdisciplinary (62 marks) and to a lesser degree transdisciplinary (39), while disciplinary approaches are of little importance (10).

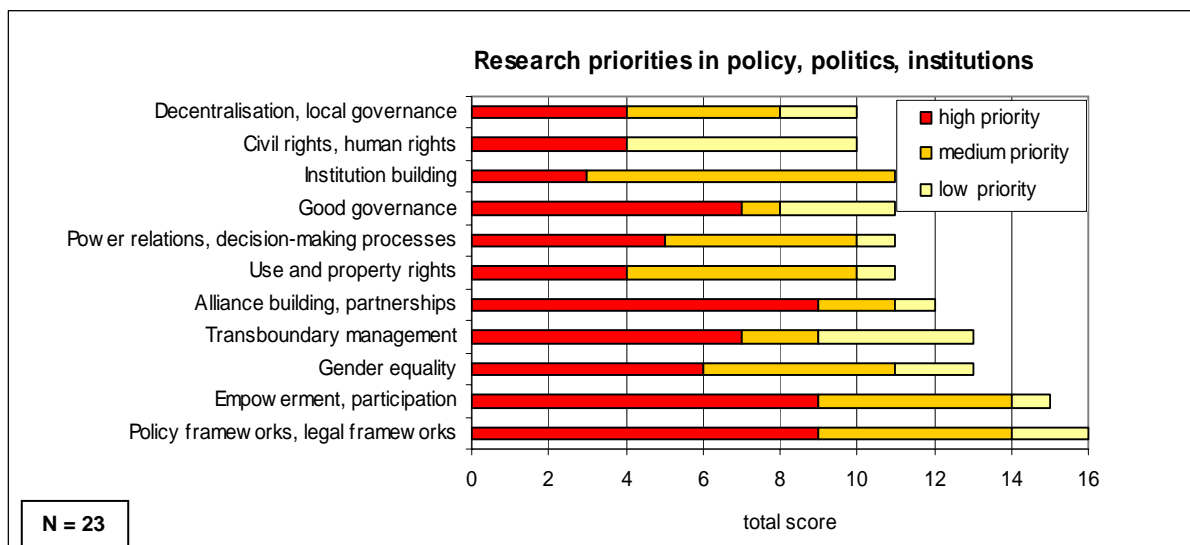
Realm 2: Policy, politics and institutions

Policy, politics and institutions, including legal frameworks, are **a high research priority for many research institutions**. Specifically, the survey shows that mountain research is mainly dealing with two broad and crucial aspects of policy. Firstly, policy is about *power relations*, and this is reflected in research: themes dealing with empowerment, including gender, power relations, and decision making processes, feature high on the priority list in mountain research. Secondly, policy includes *politics*, i.e. *negotiation processes*, and the theme related to this field – *alliance building and partnership* is an important research topic. Interestingly, *civil rights and human rights* are less prominent themes than one might have expected, especially against the background of the precarious situation of the many marginalised groups which live in mountains. However, many aspects of these themes may be covered by *empowerment* (Realm 1).

Decentralisation and local governance are not often mentioned as high priorities. This forms a certain contrast to the often heard statement that mountain development, and hence livelihood outcomes, are decided by policy and decision making outside mountain areas. The theme might be included in *good governance*, which has higher marks as a first priority.

Transboundary management is difficult to associate with any other theme in this realm; however, it is likely to be connected with themes relating to land use, such as protected area management or watershed management (see under Realm 4). Use and property rights research can be associated with livelihood research (Realm 1) and research in land use (Realm 3).

Table 5



Approaches in this realm

Interestingly, this realm shows the highest share of transdisciplinary work of all covered by this survey (54 marks). Interdisciplinarity is also prominent (40), while disciplinary research is used relatively rarely (8).

Realm 3: Biophysical environment and ecology

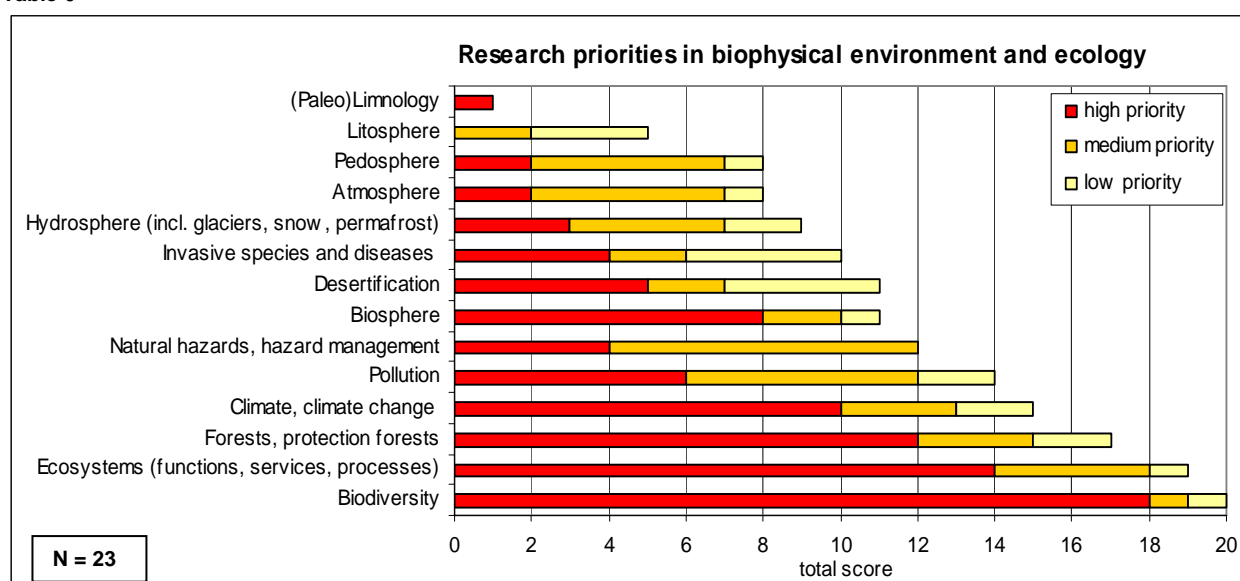
Research in biological and life science themes dominate this realm, followed by climate change research and risk/hazard issues. *Biodiversity* is the single most important research topic. Other topics such as forest, biosphere, invasive species, are related to it. Moreover, the theme reappears as agro-biodiversity under land use (Realm 4). All this reflects the great importance that mountains have for global biodiversity, and probably also the willingness of donors to fund programmes in this field. Mountain areas are global biodiversity hotspots and feature high levels of endemism. Mountain regions such as the Andes, the Himalaya-Yunnan massif, Borneo and New Guinea, and the Cape region of South Africa, are zones of highest biodiversity on earth. While its value has long been known to local residents and many scientists, external interest groups including pharmaceutical companies are becoming increasingly aware of its commercial potential.

Owing to their steep ecological gradients, mountains are also very sensitive indicators of *environmental change, including climate change*. This explains the high importance of this topic as a research theme.

Themes dealing with *risk and hazard* follow suit, covering a wide range of subjects such as natural hazards and protection against hazards; pollution, desertification.

Interestingly, research in *hydrosphere* is much less prominent than could be expected given the important role that mountains have for the provision of fresh water (mountains as water towers), and this not only in arid regions. The European Alps, for example, contribute twice the amount of river runoff per unit area as the surrounding lowlands. Glaciology also gets remarkably low marks in the light of the almost global phenomenon of glacier retreat. The theme is probably treated within climate change research.

Table 6



Approaches in this realm

Work is dominated by interdisciplinary (83 marks) and disciplinary approaches (39); this is the highest relative value of disciplinary research in any domain of this survey. Transdisciplinary work follows last (25 marks).

Realm 4: Land use

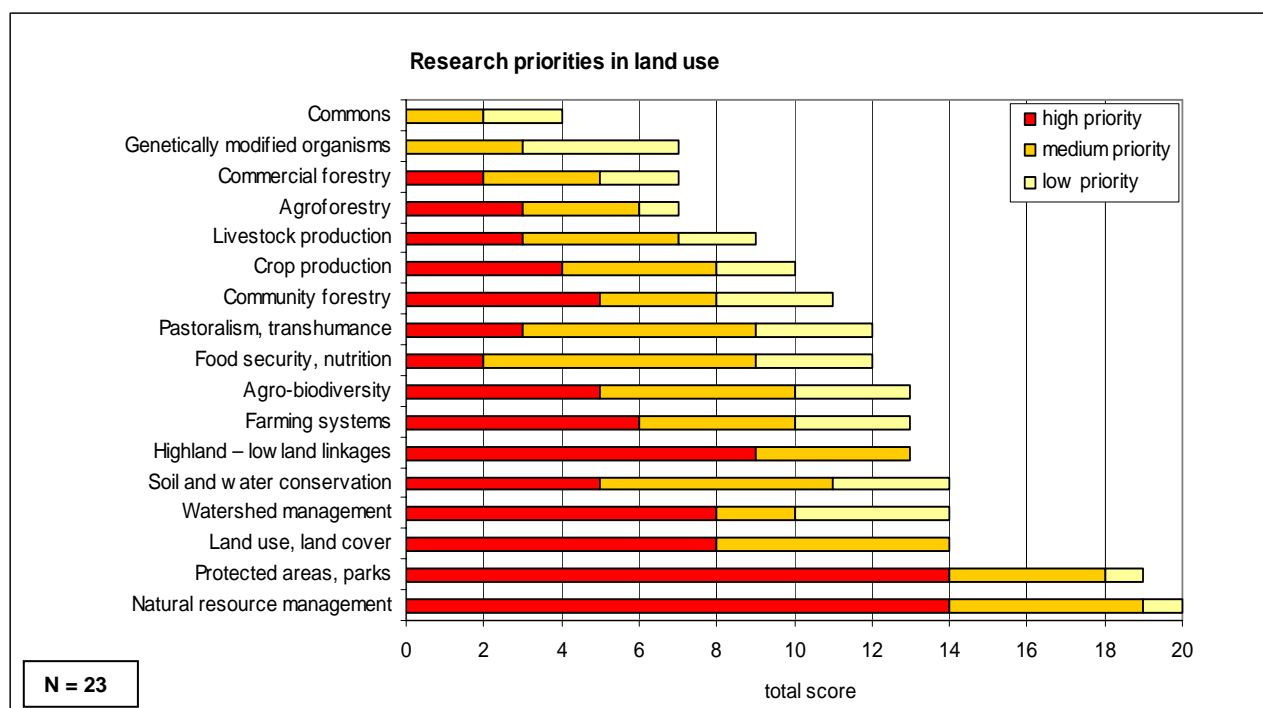
Research in this realm is dominated by a **focus on conservation and protection, rather than on production**. This is reflected by the top 5 themes (Table 6), which all contain important conservation and protection elements, relating either to specific resources such as soil and water, to specific areas (watersheds, protected areas and parks, agro-biodiversity), or to natural resources management in general. This focus on conservation and protection follows a global trend in land use: globally, protected areas have increased 6-8 fold in the last 40 years, and the share of protected areas in mountains is higher than in most other eco-zones and is growing rapidly (1997:9%, 2003:16%). Moreover, 45% of all biosphere reserves of UNESCO's Man and Biosphere (MAB) Programme are in mountain areas.

Production aspects: livestock is as important as a research priority as crop production. This reflects the key role that livestock (including pastoralism and transhumance) has in sustaining mountain livelihoods, and which generally increases in importance with altitude. Forest management is also mentioned; again, this reflects the nature of mountain land use pattern which are generally diversified, with grazing and forest use being more important than in lowland areas. Interestingly, commons are not specifically an issue (any more) for mountain research. Neither are genetically modified organisms.

Highland-lowland linkages are important in many mountain land use systems (lowland markets, agricultural inputs from lowland industries, labour migration, etc); the theme thus figures prominently among the high and medium research priorities.

Strikingly, *food security* and nutrition has among the lowest marks as a high priority of all themes in this realm; strikingly, as food security is an issue high on the priority list of many local mountain communities; moreover the issue is closely linked to poverty and poverty alleviation, a key theme of the MDGs.

Table 7



Approaches in this realm

Most of the research work is done by interdisciplinary work (86 marks), followed by transdisciplinary (48) and disciplinary work (22).

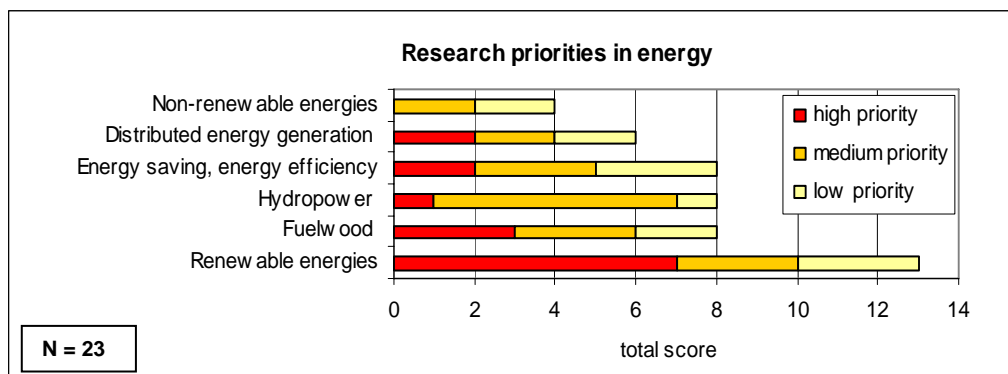
Realm 5: Energy

The survey results create the impression that overall, **energy is not a high priority in research**. This is surprising insofar, as it forms a marked contrast to the importance of the energy issue, specifically with regard to the following four contexts:

- the *current global debate* on energy supplies and increasing energy prices; a debate which is fuelled by the key role which energy plays in all aspects of development
- the fact that *mountain communities* often face *increased difficulties* in securing their energy supplies, which is due to their relative isolation (and difficult access), to often limited availability of local supplies such as wood fuel especially at higher altitudes, and to their higher per-capita energy demands as compared to lowlands owing to harsher climates.
- the *very high priority* that *mountain populations* give to *safe and affordable energy* supplies in practically all mountain regions of the world
- and, not least, the *great potential* of many mountain areas for the provision of renewable energy: to be harnessed this needs upfront investment beyond local means. A case in point is (small-scale) hydropower, a mature technology with a proven track record.

The few institutions of the Partnership Research Initiative that are active in the energy sector focus on renewable energies rather than on non-renewable ones, and to them, energy saving and efficiency of use are as important as supply-side research.

Table 8



Approaches in this realm

This realm is dominated by transdisciplinary (17) and interdisciplinary approaches (15). Disciplinary work is much less important (6 marks)

Realm 6: Economy, economics

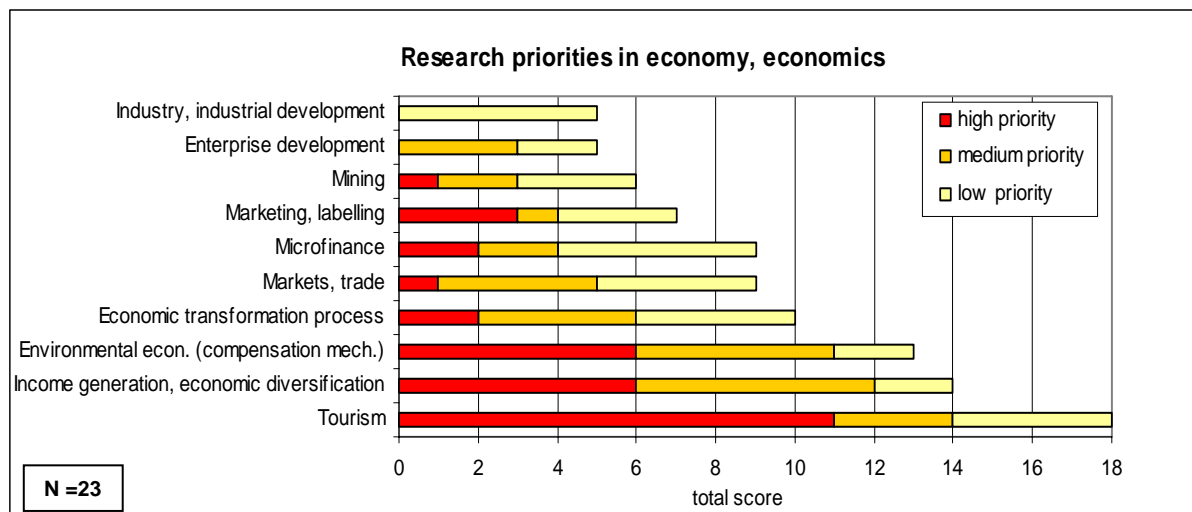
Economy and economics as a whole carry significantly less weight as research fields than biophysical, land use and policy aspects of mountain areas.

Tourism, followed by income generation and diversification are the most important research priorities, alongside research in environmental compensation mechanisms. Market and enterprise development, and industry and mining are clearly less important.

Research efforts are thus focussed on the known and often cited assets of mountain regions, of which the *recreational value of mountains* is seen as most promising; followed by high cultural and biological *diversity* that lays the foundation for diversified economies and livelihoods. The provision of *environmental services* mainly for surrounding (lowland) regions and centres is the third asset; and there is growing consensus in the research and development community that these services should be compensated for.

Interestingly, the mountain research community appears to give *little attention to the finance sector*. Microfinance is not often mentioned as a research priority, at least not as a high priority. This is confirmed by the low priority given to the finance sector in general (see realm 7). However without more insight into financial mechanism and instruments, economic development is difficult to achieve, and economic development is part and parcel of sustainable development.

Table 9



Approach in this realm

Transdisciplinary and interdisciplinary approaches are much more important (32 and 29 marks, respectively) than disciplinary work (9 marks only).

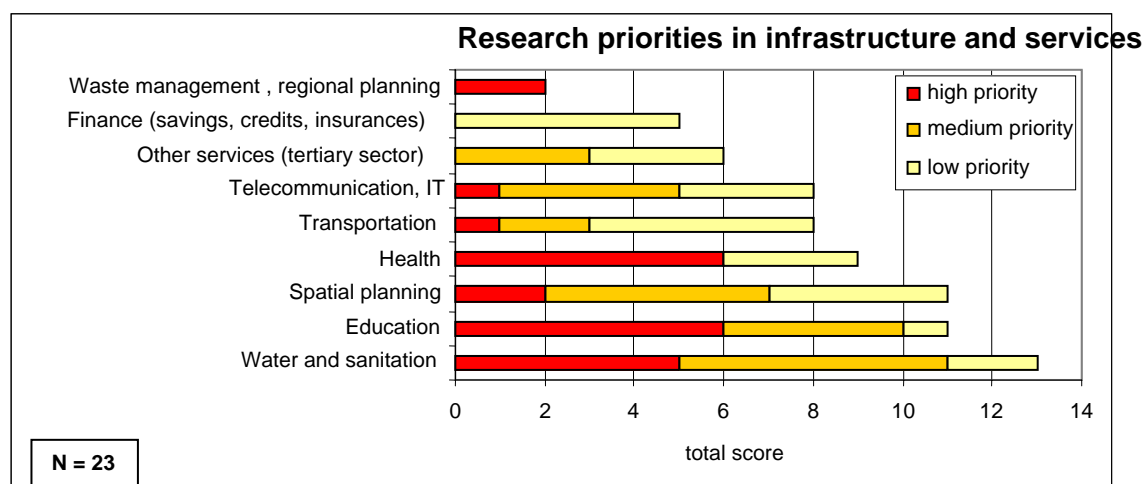
Realm 7: Infrastructure and services

Research in infrastructure and services are **not domains that have priority for most research institutions**. *Water and sanitation, education, and spatial planning* are the fields most often mentioned as research activities. Also *health* is important as a high research priority.

Thus, the internal prioritisation in this domain (water, education, and health ranking higher on the agenda than other activities) *corresponds well with the expressed needs of mountain communities* as known from many local and regional assessments. However, it is remarkable that infrastructure as a whole does not receive more attention in mountain research. This is especially true for *transportation*; given the crucial importance access is known to have on mountain livelihoods and development in general.

Also research dealing with *finance aspects* (including all *aspects of microfinance*, i.e. saving, credit, and insurance) receives low overall ranking and is not a high priority for any of the research institutions that participated in this survey. This comes as a surprise given the riskiness of mountain livelihoods, and the potential of microfinance in reducing risk and improving livelihoods in general. Quite apart from the increasing body of evidence which shows the importance of a functioning finance sector for development in general, both past and present.

Table 10



Approach in this realm

Interdisciplinary work dominates by a wide margin (32 marks), followed by transdisciplinary (13) and disciplinary work (9).

Survey 2: What future for mountain research?

The questionnaire for Survey 2 was sent to all members of the Mountain Partnership through the Partnership Secretariat at FAO in March 2006, as its topic was felt to be a question of broader interest. By contrast with Survey 1, responses to Survey 2 were to be given not from an institutional but from a **personal point of view** (*Appendix 3*).

Out of the 120 members of the Partnership registered at the time of the survey, the electronic survey was answered by a total of 40 respondents, belonging to the following categories:

Table 11: respondents of Survey 2

Lead members of the <i>Research Initiative</i>	3
Members of the <i>Research Initiative</i>	26
Other members of the MP	9
Non-members of the MP	2
Total	40

Thus, only a few members outside of the Research Initiative took part in the survey. Nevertheless, valuable information was obtained.

In the following paragraphs, the results of Survey 2 are discussed in 4 sections. These are:

1. **A ranked list: core problems to be dealt with in future research**
2. **Open statements: core problems and potentials for future research**
3. **How to create an environment conducive for research?**
4. **Conclusion: a pathway for future research**

2.1. A ranked list: core problems to be dealt with in future research

The survey presented a list with 30 core problems (for more information, see questionnaire in Appendix 3).

Respondents were asked to rank the core problems for future research by allocating 0-3 points, depending on their rating: (3 = very high priority, 2 = high, 1 = medium, and 0 = no or low priority). A total of 30 points could be allocated. Table 12 presents the results.

Table 12: Core problems in mountain areas that need to be addressed by research in future

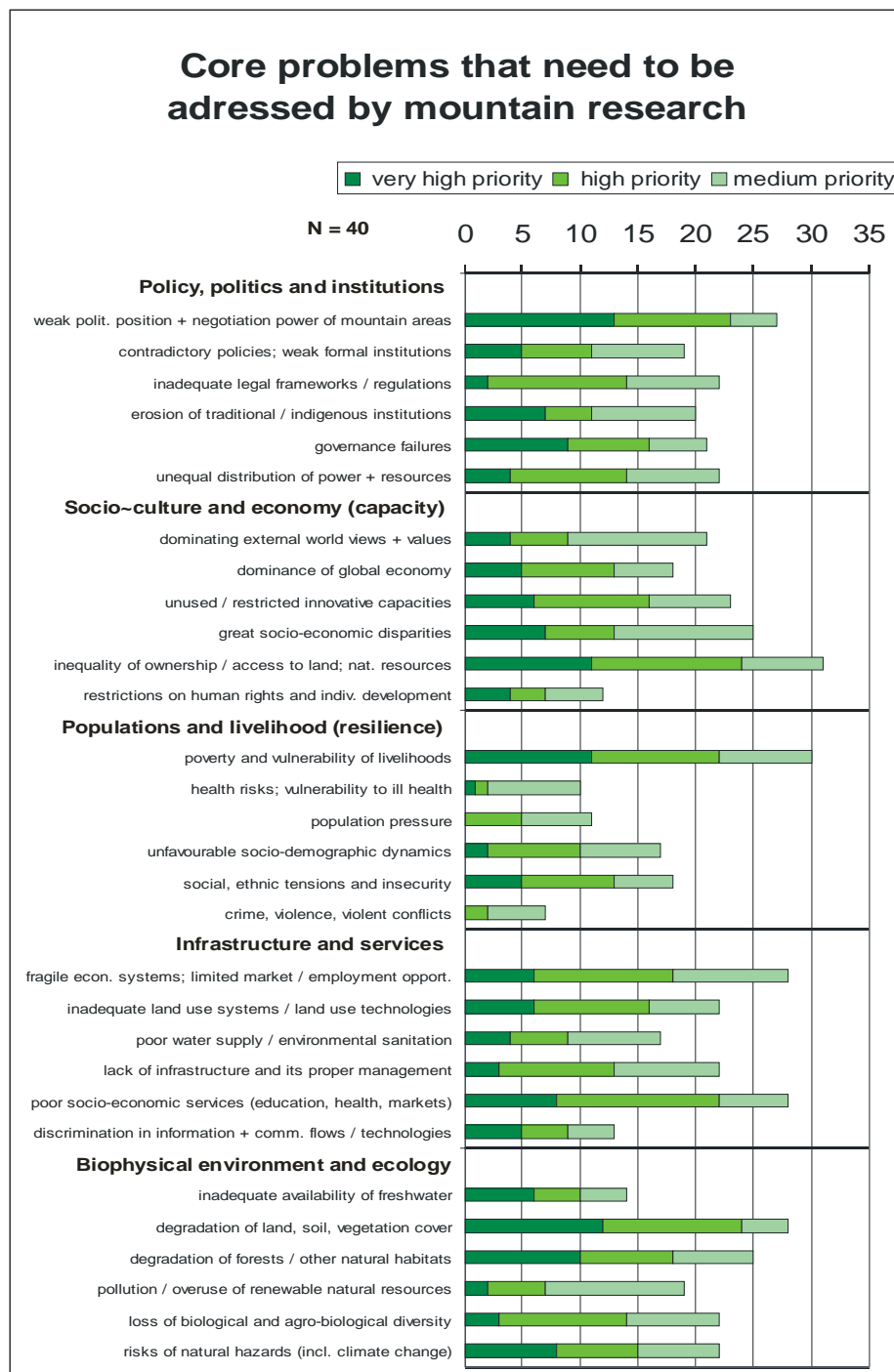


Table 12 shows that respondents saw a need for future research in all major research domains. Allocations of importance were balanced, although *population and livelihood* (resilience) and *socio-culture and economy* were mentioned less often than the other domains. This may be indicative of respondents' perceptions that framework conditions such as policy, institutions, infrastructure, and the bio-physical setting should receive more attention in future.

A closer look at the individual problems in Table 12 shows that highest rankings were assigned to:

- (1) *weak political position and negotiation power,*
- (2) *inequality of ownership/access to land and natural resources,*
- (3) *poverty and vulnerability, and*
- (4) *degradation of land, soil, vegetation cover.*

This response highlights the importance assigned to the linkages between populations and their natural resource base in mountains, and their dependency on this resource base. Use of natural resources is of central interest. High rankings for other core problems in related spheres support this conclusion (see the high rankings for: *degradation of forests, poor economic services and fragile economic systems/weak markets, great socioeconomic disparities and governance failures*). Altogether, the rankings indicate that mountain societies are seen as subject to inequality, that resources are deteriorating, and that local capacities and strategies are not capable of coping quickly enough with rapid change.

Social and demographic core problems such as *unfavourable socio-demographic dynamics, population pressure, crime, violence and conflicts* seem to be less dominant in the eyes of the respondents. This could be interpreted to mean that mountain societies still have a high potential for recreating themselves if support is adequate. Consequently, institutional aspects and aspects of individual development and freedom also emerged as less prominent (for example, *restrictions on human rights or health risks*). But this does not mean that they should be ignored, as respondents did mention them in their comments on the core problem list.

2.2. Open statements: core problems and potentials for future work

In order to overcome the limitations associated with a closed list of core problems, the e-survey provided space for open statements. Respondents were thus given a chance to add information and personal perceptions of core problems or key issues that should be prioritised in future research. Also, they were asked to give information on where they saw specific potential and opportunities for mountain development that should be a focus of research in future.

Interestingly, the results show that the number of open statements on potentials outnumbers the number of core problems. Whereas respondents mentioned 45 core problems in addition to the list that already includes 30 core problems, nearly 80 statements were made on potentials for mountain development!

A second look shows that core problems and potentials have to be analysed in a synoptic manner. Addressing core problems is itself a potential for development work. Core problems or potentials mentioned are thus often one and the same. Therefore, respondents' statements on core problems and on potentials for future work are discussed together in the following section.

The respondents' statements can be grouped into five themes:

- **Sector Economy and Sustainable Land Management**
- **Infrastructure**
- **Governance and Multi-stakeholder Processes**
- **Globalisation and Local Erosion Processes**
- **Core Issues for Research Institutions**

Table 13: Open statements on core problems and potentials relating to mountain development

Thematic fields	Key words			Total score
		Core problem	Potential for development	Potentials & problems
Sector economy and Sustainable Land Management (SLM)	Tourism	3	8	11
	Niche products/markets	5	18	23
	Global Markets		3	3
	Knowledge/Technology	3	6	9
	Environmental Services	5	5	10
	Development Plans		7	7
	Land Management		7	7
	Subtotal	16	54	70
Infrastructure	Energy	1	3	4
	Cross-cutting	1		1
	Infrastructure/ITC	2		2
	Education	2	1	3
	Health		1	1
	Subtotal	6	5	11
Governance and multi-stakeholder processes		8	8	16
	Subtotal	8	8	16
Globalisation and cultural erosion	Climate Change	2		2
	Economic Transformation	2		2
	Migration	1		1
	Conflicts	2		2
	Culture/Identity	2	5	7
	Alliances		2	2
	Subtotal	9	7	16
Core Issues relating to research work	Funding	1		1
	Research Strategy	4		4
	Tools	1	5	6
	Subtotal	6	5	11
GRAND TOTAL		45	79	124

35 respondents made remarks under "open statements"

• **Sector Economy and Sustainable Land Management**

Core problems that should be investigated by research:

Out of the 45 core problems mentioned in Table 13, 16 are related to local socio-economic and sustainable land management issues. Respondents underlined the need to analyse local transformation processes and the interaction between local and global processes. They also said that research should go beyond analysis of how globalisation threatens local culture; in their view, research should increasingly focus on how local potential can be employed for sustainable development.

As to specific problems, markets and **access to markets** were emphasised. Not surprisingly, **tourism** – often seen as a panacea for eradicating mountain poverty – was mentioned several times. Statements were careful to confirm that the role of tourism must be put into a broader context of sustainability.

Respondents also saw potential in **local knowledge**, especially in the realm of technology development, and in **local natural resources**, especially with regard to their sustainable management. Only a few sectoral issues were mentioned as core problems, for example, degradation or lack of micro-finance. Thus the integral view predominated.

Potentials for development that should be investigated by research:

Most of the statements (54 out of a total of 79!) referred to the economic sector, with half of them relating to sustainable land management. This clearly reflects the relevance generally assigned to natural resources for economic development in mountain areas.

High biodiversity was seen as a basic asset for local product development. Respondents assigned the highest potential to development of local **niche production and access to markets** (18 resp.), with only little reference to the global market. Statements underlined the necessity of carefully considering markets also at regional and national levels, in order to identify and promote sustainable livelihood alternatives.

In relation to sustainable land management, respondents emphasised the need for **development plans** that take the ecosystem into account in a holistic approach, and that combine protection and management issues. A challenge was identified in terms of how to use protected areas as a driver for development – an often expressed dilemma in mountain development. Respondents favoured an ecosystem approach and capitalisation on local sustainable strategies to ensure that development plans become sustainable and predominantly benefit local communities.

Respondents also mentioned the multi-functionality of mountain ecosystems as an important potential, and saw **environmental services** as a contribution to development beyond the local level (5 resp.). Payments for such services were thus seen as an important instrument in mountain development.

Respondents also saw a high potential in increased knowledge and **know-how transfer**, if carefully combined with local knowledge and models for sustainable development (6 statements). This is a specific challenge for future research.

• **Infrastructure**

Core problems for future research:

Surprisingly, respondents identified few core problems to be addressed in future in this field (6 statements on education and knowledge management, infrastructure/ITC or energy). One statement directly stressed the interrelationship of infrastructural services. Access to basic services is often not guaranteed in mountain areas and this was not reflected in most statements.

Potentials for development for future research:

Investments in the energy sector were seen as a potential, as in the absence of national supply systems, local small-scale renewable energy generation and distribution become a prerequisite for mountain development. Individual statements relating to health and education emphasised the need for embedding activities in the local social and ecological system. Here too, it can be stated that sector approaches seem to be less promising for experts, and solutions were proposed with a view to the service system as a whole.

- ***Governance and multi-stakeholder processes***

Core problems for future research:

A wider set of core problems (8 statements) address governments and policy-makers in their interaction with society, especially in regard to multi-stakeholder processes (MSP). Here, respondents' statements confirmed that the widespread lack of adequate institutional set-up, the complexity of power relations, and the challenge of up-scaling contextualised experience provide an important field of activity for research.

Potentials for development for future research:

The role of governance and thus of national governments in creating a framework that supports multi-stakeholder processes was seen as a great potential (8 statements). The Mountain Partnership, local participation, and good governance were seen to constitute a triangle that could support multi-stakeholder processes of informed decision-making on issues of sustainability and sustainable development. In order to make multi-stakeholder processes more equitable and balanced, respondents proposed empowerment as an appropriate approach. Tackling gender issues, enhancing capacity development for NGOs, and reducing corruption as a major challenge to good governance were mentioned as specific potentials.

- ***Globalisation and local erosion processes***

Core problems for future research:

Another important cluster of core problems to be addressed by future research is connected to local-global interaction (9 statements). Globalisation propels transformation processes at the local level that often exceed the capacity of local cultures to adapt. Like ecological erosion and degradation, social and cultural erosion processes further undermine this capacity. Statements made by the respondents strongly emphasised the need to know more about aspects of such destructive effects. This is more urgent when they turn into social or resource conflicts, loss of identity, enforced migration, or economic transformation dominated by outside economic forces. In the same way, respondents advocated research on climate change specifically in terms of its effects at the local level. In all these statements, respondents touched on issues of vulnerability and resilience without actually mentioning them.

Potentials for development for future research:

7 statements referred to local culture and identity as important means to mitigate the local impacts of globalisation. This topic is closely related to issues of governance and multi-stakeholder processes, and underlines the prevalent role of empowerment. Respondents emphasised that acknowledgement and empowerment of local culture and communities create a source of inspiration and innovation for mountain development. Networks, partnerships and alliances can provide the organisational basis for lobbying. Of course, preservation and integration of local knowledge systems – already mentioned in the sector economy and SLM – is another crucial element in strengthening local resilience.

- ***Core problems and potentials relating to research work***

Core problems for future research:

6 statements referred directly to core problems that research institutions face. Along with the problem of funding, the exclusivity of the research community and the lack of visibility of mountain research within the wider research and development community were mentioned as core problems. According to some respondents, research should also focus more on capitalisation on experience in the form of tools that allow informed decision-making in sustainability approaches. Therefore, development and implementation of coherent research strategies, such as the GLOCHAMORE research strategy, are seen as important.

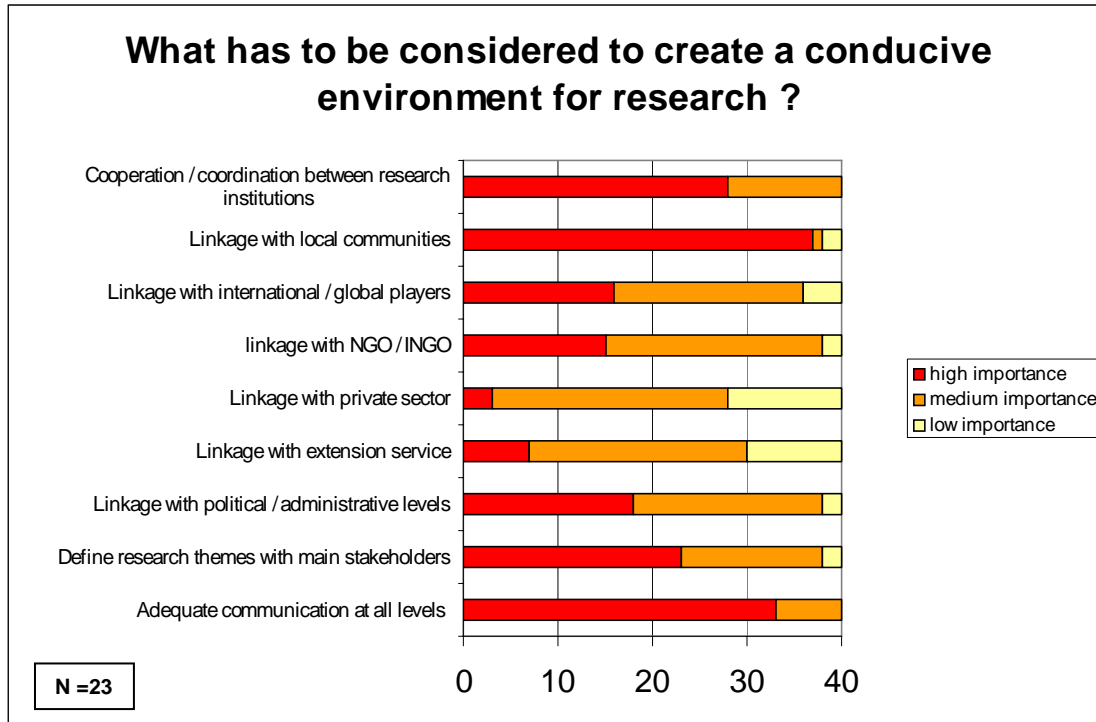
Potentials for development for future research:

Specifically, the potential of research was seen in its capacity to provide tools. Generation and elaboration of information, either for decision support or for the design of multi-stakeholder processes, were mentioned as examples. Research institutions can also advocate mountain issues to sensitise a wider public.

2.3. How to create an environment conducive for research?

The e-survey also addressed the situation of research in its societal context. The results show that from the perspective of the respondents, researchers can actively contribute to the creation of an environment which is conducive for research, if a number of points are considered (Table 14).

Table 14: A conducive research environment



Generally speaking, it is important to establish linkages and maintain good relations with different actors, and this requires adequate communication at all levels. However, not all actors seem to be equally important. Of paramount importance for researchers are good linkages with local communities, which is not astonishing since researchers usually 'depend' in many respects on the hospitality, goodwill, and support of local people (e.g. logistics, informants, guides etc.). Cooperation and coordination between research institutions were also rated as highly important, while cooperation with the private sector were not considered as very important.

The definition of research themes and questions with the main stakeholders, a point which endorses transdisciplinary approaches, was seen as very important, too. In this respect however, research reality probably also still does not live up to its own expectations.

In addition to the above points derived from Table 14, other factors were mentioned that are important for research in mountain areas in general. These are:

- adequate *funding*
- adequate *knowledge* on the socio-cultural environment in which research takes place
- appropriate research *methodology*; inter- and transdisciplinary research approaches; *comparative research framework* (between different mountain regions); *multi-national* research programmes (owing to the transboundary setting of many mountain areas)
- *link* between research, *policy formulation*, and *implementation*
- conducive *political situation*
- collegial, communicative, *open relationships between knowledge owners*
- *access* to information and colleagues
- *education* for sustainable development; capacity building
- *coordination between researchers*; identification of researchers and coordination at personal level

2.4. A pathway for future research

The results of survey 2 show that in the eyes of the respondents, research has an important role to play in mountain development by providing a better understanding of economic issues and land management potentials.

In the eyes of the respondents, research is expected to produce knowledge about impacts at higher organisational and spatial levels, especially with regard to identifying local potentials to mitigate such impacts. Specifically, research can contribute to mountain development by:

- assessing the potential of mountain biodiversity and mountain resources in general, especially with regard to regional and international markets and the development of sustainable local tourism;
- helping find ways, means and institutions conducive to the integration of local people as actors and stakeholders in development, and in supporting local knowledge in technology development;
- helping establish mechanisms that assure local benefits from development activities, including payment for ecosystem services.

Mountain research and research partnerships can also contribute substantially to the promotion of good governance. Respondents of the survey mention the following possibilities:

- enhance processes of institutional development and capacity building at all levels of society;
- identify adequate institutional frameworks and multi-stakeholder processes focusing on specific development issues;
- up-scale contextualised experience while strengthening local capacity and power;
- create and capitalise on alliances within and among mountain areas;
- provide tools for informed decision-making.

The respondents give less consideration to classical sectoral issues, but in the eyes of the authors of this report, they should not be forgotten. In mountain areas, sectoral approaches have specific importance, as infrastructure and supply of services are generally low and poverty is often widespread. While the respondents attributed a certain importance to the energy sector, the high priority given to energy on the global agenda was not reflected. However, energy – as well as other sectoral issues – might have been included in connection with socioeconomic and ecological research issues.

In general, the open statements relating to core problems and potentials of mountain areas to be dealt with by research show that researchers within the Mountain Partnership research community are turning towards a more integrative view on research and development, and they emphasize the need to place greater weight on the socio-political and economic frameworks than has been the case in the past.

Appendices

Appendix 1: List of responding institutions

Appendix 2: Survey 1: Questionnaire

Appendix 3: Survey 2: Questionnaire

Appendix 1:

List of responding institutions (survey 1), and individuals (survey 2)

Institutions responding to Survey 1: Status of mountain research

The questionnaire was sent to all members of the Research Initiative. It aimed at seeking the institutional perspective.

Institutions responding to survey 1		
Centre for Development and Environment, CDE	Switzerland	L
Centre for Mountain Studies	Scotland	M
Centre of Alpine Ecology (CEA)	Italy	L
Consortium for Sustainable Development in the Andes (CONDESAN)	Peru	M
Council for Scientific and Industrial Research (CSIR)	Ghana	M
DIVERSITAS Global Mountain Biodiversity Assessment (GMBA)	Switzerland	L
Ev-K ² -CNR Committee	Italy	L
Federal Institute for Less-favoured and Mountainous Areas (BABF)	Austria	M
Ghana Wildlife Society	Ghana	L
International Centre for Integrated Mountain Development (ICIMOD)	Nepal	M
International Mountaineering and Climbing Federation (UIAA)	Italy	M
International Potato Center (CIP)	Peru	L
International Scientific Committee on Research in the Alps (ISCAR)	Switzerland	M
MAB-6 Center	Russia	L
Mountain Research Initiative	Switzerland	M
National Office of Forests, Nature and Land Management	Liechtenstein	M
Pakistan Forest Institute (PFI Pakistan)	Pakistan	M
Regional Environmental Centre for Central Asia (CAREC)	Kazakhstan	M
Tebtebba (Indigenous Peoples' International Centre for Policy Research and Education)	Philippines	M
The III Millennio Foundation	Italy	M
UNESCO	France	M
United Nations University (UNU)	Japan	L
Wonderland Development Organisation (WDO)	Swaziland	M

L = Leading member of Research Initiative, M = member of Research Initiative

Respondents to Survey 2: 'What future for mountain research?'

	Name	Institution	Member of
1	Gurung, Jeannette	Women Organizing for Change in Agriculture and Natural Resource Management (WOCAN)	RI
2	Dr. Schaaf, Thomas	UNESCO	RI
3	Purwanti, Devi	Embassy of Indonesia in Paris, France	RI
4	El-Khodari, Nabil	Nile Basin Society	IMP
5	Schommer, Beth	Ev-K2-CNR Committee	Lead RI
6	Selim Karaca	The Ministry of Environment and Forestry, Turkey	RI
7	Hovorka Gerhard	Federal Institute for Less-Favoured and Mountainous Areas (Bundesanstalt fuer Bergbauernfragen)	RI
8	Kostas Katsogiannos	Ministry of Education, Operational Programm for education in Greece 2000-2006	unidentified
9	Price, Martin	Centre for Mountain Studies (CMS)	RI
10	Krause, Amy	Mountain Culture, The Banff Centre	RI
11	Pier Carlo Sandei	EURAC	RI
12	Dejene, Alemneh	FAO	RI
13	Piserchia Antonio	III Millenio Foundation	RI
14	K N Vajpai	Prakriti	RI
15	Benedicto Q. Sánchez	Broad Initiatives for Negros Development (BIND)	IMP
16	Blamont Denis	World Mountain People Association (WMPA)	RI
17	Eleanor P. Dictaan-Bang-oa	Tebtebba	RI
18	Yonzon, Pralad	Resources Himalaya Foundation	IMP
19	Yavari Ahmad-Reza	Mountain Environment Protection Society	IMP
20	Ngece Kunga	Volunteers For Africa/ ECODECO Partnership	IMP
21	Wachs, Ted	Mountain Research and Development	RI
22	Tony Mensah-Abrampah	Akwapim Mountains Women Forum	IMP
23	Scheurer, Thomas	International Scientific Committee Alpine Research ISCAR	RI
24	Jordanco Milosevski	Agency for Environment Ministry for Environment and Physical Planning, Republic of Macedonia	IMP
25	Wollscheid, Kai	CIC - International Council for Game and Wildlife Conservation	RI
26	Egerer, Harald	UNEP	IMP
27	Jansky, Libor	UNU Tokyo	Lead RI
28	Yeshey Dorji	Ministry of Agriculture, Royal Government of Bhutan	RI
29	Kreuzberg, Elena	Central Regional Environmental centre for Central Asia (CAREC)	RI
30	Lorbach Joachim	FAO	RI
31	Mikolajuk Zbigniew	ICIMOD	RI
32	Saravia, Miguel	InfoAndina-CONDESAN	RI
33	Gigliotti Paola Virginia	UIAA, International Mountaineering and Climbing Federation	RI
34	Sattar Nikhat	IUCN Asia	RI
35	Sow, Yacine	Ministry of Agriculture and Forests, Guinea	RI
36	Jovic, Dusan	Ministry of Agriculture, Forestry and Water Management-Directorate of Forests, Republic of Serbia	RI
37	Valeria Nikonova	Alliance of Central Asian Mountain Communities (AGOCA)	IMP
38	Atri, Sideh	Department of the Environment-Islamic Republic of Iran	RI
39	Clare	British Mountaineering Council	unidentified
40	Kohler Thomas	CDE University of Berne	Lead RI

RI = member of Research Initiative; Lead RI = Leading member of Research Initiative, IMP = other member of International Mountain Partnership

Members RI: 26

Leading members RI: 3

Other members IMP: 9

Unidentified: 2

Appendix 2: Questionnaire of Survey 1

1. Thematic fields of involvement of your institution relating to mountain research

Please fill in:

Name of organization:

Please fill in:

Your name and e-mail contact:

Please insert in which thematic fields **your institution** is active, and indicate priority and research approach.

Research themes / realms	Research priority			approach		
	high	medium	low	disciplinary	Inter-disciplinary	Trans-disciplinary
<i>Social, socio-economic and socio-cultural themes</i>						
Livelihoods						
Lifestyle and consumption patterns						
Ethnicity, indigenous communities						
Social stratification						
Population dynamics						
Migration						
Perceptions and attitudes						
Local culture, local knowledge						
Endogenous development						
Poverty, marginalisation						
Urbanisation						
Vulnerability, resilience, coping strategies						
Conflicts, conflict transformation						
Religion, spirituality						
Other (specify)						
<i>Policy, politics and institutions</i>						
Policy frameworks, legal frameworks						
Civil rights, human rights						
Use and property rights						
Empowerment, participation						
Power relations, decision-making processes						
Gender equality						
Decentralisation, local governance						
Good governance						
Institution building						
Alliance building, partnerships						
Transboundary management						
Other (specify)						

Appendix 2

Research themes / realms	Research priority			Approach		
	high	medium	low	disciplinary	Inter-disciplinary	Trans-disciplinary
Biophysical environment and ecology						
Atmosphere						
Hydrosphere (including glaciers, snow, permafrost)						
Biosphere						
Pedosphere						
Litosphere						
Ecosystems (functions, services, processes)						
Biodiversity						
Forests, protection forests						
Desertification						
Pollution						
Climate, climate change						
Natural hazards, hazard management						
Invasive species and diseases (plants, animals)						
Other (specify)						
Land use systems						
Land use, land cover						
Natural resource management						
Highland – lowland linkages						
Commons						
Food security, nutrition						
Watershed management						
Protected areas, parks						
Farming systems						
Crop production						
Livestock production						
Pastoralism, transhumance						
Agro-biodiversity						
Agroforestry						
Commercial forestry						
Community forestry						
Soil and water conservation						
Genetically modified organisms						
Other (specify)						
Energy						
Non-renewable energies						
Renewable energies						
Fuelwood						
Hydropower						
Distributed energy generation (<i>decentralised and small-scale fossil and renewable energy generation</i>)						
Energy saving, energy efficiency						
Other (specify)						

Appendix 2

Research themes / realms	Research priority			Approach		
	high	medium	low	discipli- nary	Inter- discipli- nary	Trans- discipli- nary
Economy, economics						
Markets, trade						
Enterprise development						
Income generation, economic diversification						
Marketing, labelling						
Industry, industrial development						
Mining						
Tourism						
Microfinance						
Economic transformation process						
Environmental economics (e.g. compensation mechanisms)						
Other (specify)						
Infrastructure and services						
Water and sanitation						
Health						
Transportation						
Education						
Telecommunication, IT						
Finance (savings, credits, insurances)						
Other services (tertiary sector)						
Spatial planning						
Other (specify)						

2. *Geographical regions of involvement of your institution relating to mountain research*

Regions	Please specify regions of activity (country names, names of specific mountain regions)
<input type="checkbox"/> Europe	
<input type="checkbox"/> Russia	
<input type="checkbox"/> Asia-Pacific	
<input type="checkbox"/> Africa	
<input type="checkbox"/> America	
<input type="checkbox"/> Other regions (e.g. Antarctica)	
<input type="checkbox"/> global involvement	

3. *Kind of involvement of your institution relating to mountain research*

Please indicate the kind of involvement of your institution relating to mountain research (you may of course tick several squares!)

- | | |
|---|---|
| <input type="checkbox"/> Research field work | <input type="checkbox"/> Capacity development, education, training |
| <input type="checkbox"/> Research coordination | <input type="checkbox"/> Publication, documentation, library services |
| <input type="checkbox"/> Research funding | <input type="checkbox"/> Communication, event management |
| <input type="checkbox"/> Outreach (implementation of recommendations of research) | <input type="checkbox"/> Data banking |
| <input type="checkbox"/> Extension | <input type="checkbox"/> Awareness creation, sensitisation |
| <input type="checkbox"/> Policy development, policy advice | |

----- End – survey research members -----

Appendix 3: Questionnaire of Survey 2

Mountain Partnership Research Initiative

What Future for Mountain Research?

A Survey

This survey aims to assess core problems in mountain development, future trends, and upcoming issues in mountain research. We are therefore seeking **your personal opinion** on relevant issues and themes that you feel should be addressed by mountain research in the future.

1) Core problems that need to be addressed by mountain research in the future

a) From your personal perspective, what are the core problems that mountain research should emphasise in future?

The following table presents a list of 30 core problems in mountain development. The list was initially developed by the Swiss National Centre of Competence in Research North-South (NCCR North-South) in a series of global multi-stakeholder workshops, and slightly modified to address the mountain context more precisely. All of these core problems are undoubtedly important and need to be tackled; many of them have been the focus of mountain research in the past. What we are trying to identify here are the core problems that you think should be given priority as research themes in future mountain research.

Assuming you had limited research funds to allocate, which core problems would you prioritise? **Please indicate to which of the 30 problems listed below the research community should give priority in the coming years.**

In total, you have **30 points to allocate**. You are free to allocate these points among the 30 problems listed here, but the **maximum** you can allocate to any one core problem is **3 points**. Make sure you use all 30 points that you have available!

We recommend that you read through the list before you begin to allocate points!

30 core problems in mountain development	Priorities for future research 0 = no or low priority 1 = medium 2 = high 3 = very high
<i>Policy, politics, and institutions</i>	
1. Weak national political position and negotiating power of mountain areas	
2. Dominant external values and worldviews conflicting with local values and views	
3. Contradictory policies and weak formal institutions at different levels	
4. Inadequate legal framework and regulations, lack of (means of) enforcement	
5. Erosion of traditional and/or indigenous institutions	
6. Failures of governance, insufficient empowerment, and insufficient decentralisation	
7. Unequal distribution of power and resources; corruption	
8. Inequality of ownership and access to land and to natural and common property resources	
9. Inadequate and conflicting land-use systems and land-use technologies	

Appendix 3

Socio-culture and economy	
10. Social, cultural and ethnic tensions and insecurity	
11. Prevalence of crime, violence, and violent conflicts	
12. Unused or restricted innovative capacity and knowledge	
13. Great socio-economic disparities, including gender disparities	
14. Incompatible and fragile economic systems with limited market and employment opportunities; high rates of unemployment	
15. Dominance of the global economy over regional and local economies	
Population and livelihoods	
16. Restrictions on human rights and individual development potential	
17. Poverty and livelihood vulnerability	
18. Health risks and vulnerability to ill health	
19. Population pressure	
20. Unfavourable socio-demographic dynamics (dependency rate, out-migration, brain-drain)	
Infrastructure and services	
21. Poor water supply and poor environmental sanitation	
22. Lack of physical infrastructure and lack of proper management / maintenance	
23. Inadequate socio-economic services such as education, health care, markets	
24. Discrimination in information and communication flows and technologies	
Biophysical environment and ecology	
25. Inadequate availability of freshwater due to environmental limitations	
26. Degradation of land, soil and vegetation cover	
27. Degradation of forests and other natural habitats	
28. Pollution and overuse of renewable natural resources	
29. Loss of biological and agro-biological diversity	
30. Risk of natural and human-induced hazards, including climate change	

Total score allocated:

Points still left to be allocated:

b) If you feel that important core problems have been left out, use this table to add priority issues for research!

Other key issues that should be priorities for research	Comments, if any:

2) Opportunities and potentials for mountain development

Instead of dwelling on *problems* (as in the above table), research should instead consider *opportunities and potentials* for mountain development!

If you support this statement fully or to some extent, please list below keywords related to opportunities and potentials for mountain development that should be investigated in mountain research.

Opportunity / potential (keyword)	Comments, if any:

3) Conducive environment for research

From your perspective, which of the following points are important for consideration by researchers in order to create an environment conducive to research?

Please tick!

	Importance		
	Low	Medium	High
Adequate communication at all levels, including dissemination of results			
Definition of research themes with main stakeholders			
Good linkage at political and administrative levels			
Linkage with extension services			
Linkage with the private sector			
Linkage with NGO/INGO sector			
Linkage with international/global players			
Linkage with local communities			
Cooperation and coordination between research institutions			
Other (please specify): _____			
Other (please specify): _____			
Other (please specify): _____			

Thank you for your collaboration!